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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/548,469	04/13/2000	Balaram Sinharoy	AT9-99-129	7436
7590	03/25/2004			EXAMINER LI, AIMEE J
James J Murphy 5400 Renaissance Tower 1201 Elm Street Dallas, TX 75270-2199			ART UNIT 2183	PAPER NUMBER 10
DATE MAILED: 03/25/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/548,469	SINHAROY ET AL. <i>SK</i>
	Examiner Aimee J Li	Art Unit 2183

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 29 December 2003.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-14,39 and 40 is/are pending in the application.
- 4a) Of the above claim(s) 15-38 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-14,39 and 40 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-14 and 39-40 have been considered. Claims 15-38 have been withdrawn as per Applicant's request.

Amendment Non-compliance

2. Applicant's amendment fails to comply with the revised 37 CFR 1.121, which is required as of July 30, 2003. More specifically, applicant has used identified claims 15-38 as withdrawn but not provided the text of the claims. Withdrawn claims must be identified and the text must be present. The claims must be cancelled or not entered for the text of the claims to be omitted. In the future, the examiner will send out a notice of non-compliant amendment for failure to comply with the revised 37 CFR 1.121. Please see the attached flyer for more details.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-14 and 39-40 are rejected under 35 U.S.C. 102(e) as being taught by Henry et al., U.S. Patent Number 6,550,004 (herein referred to Henry).

5. Referring to claim 1, Henry has taught a method for predicting a result of a conditional branch instruction, comprising the steps of:

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- a. Determining if a specified condition register field is used to store a branch condition of the conditional branch instruction (Henry column 7, lines 36-38 and column 9, lines 31-44); and
 - b. Providing a software branch prediction of the conditional branch instruction as a function of the determination if the specified condition register field is used to store the branch condition of the conditional branch instruction (Henry Abstract, lines 13-14; column 4, lines 49-52; column 5, lines 8-12 and 35-38; column 9, lines 31-44; and Figure 2).
6. Referring to claims 2 and 9, Henry has taught wherein the software branch prediction predicts that the conditional branch instruction will be taken if the specified condition register field is used to store the branch condition of the conditional branch instruction (Henry Abstract, lines 13-14; column 4, lines 49-52; column 5, lines 8-12 and 35-38; column 7, lines 36-38; column 9, lines 31-44; and Figure 2).
7. Referring to claims 3 and 10, Henry has taught wherein the software branch prediction predicts that the conditional branch instruction will be not taken if the specified condition register field is not used to store the branch condition of the conditional branch instruction (Henry Abstract, lines 13-14; column 4, lines 49-52; column 5, lines 8-12 and 35-38; column 7, lines 36-38; column 9, lines 31-44; and Figure 2).
8. Referring to claims 4 and 11, Henry has taught wherein the software branch prediction predicts that the conditional branch instruction will be not taken if the specified condition register field is used to store the branch condition of the conditional branch instruction (Henry

Abstract, lines 13-14; column 4, lines 49-52; column 5, lines 8-12 and 35-38; column 7, lines 36-38; column 9, lines 31-44; and Figure 2).

9. Referring to claims 5 and 12, Henry has taught wherein the software branch prediction predicts that the conditional branch instruction will be taken if the specified condition register field is not used to store the branch condition of the conditional branch instruction (Henry Abstract, lines 13-14; column 4, lines 49-52; column 5, lines 8-12 and 35-38; column 7, lines 36-38; column 9, lines 31-44; and Figure 2).

10. Referring to claims 6 and 13, Henry has taught wherein the specified condition register field is N, where N is an integer (Henry column 7, lines 36-38 and column 9, lines 31-44).

11. Referring to claims 7 and 14, Henry has taught wherein the specified condition register field is a multiple of N (Henry column 7, lines 36-38 and column 9, lines 31-44). In regards to Henry, the field is located anywhere within the condition register, as long as the particular field exists, the prediction is based on this field.

12. Referring to claim 8, Henry has taught a processor comprising:

- a. An instruction fetch unit for fetching a conditional branch instruction (Henry column 6, lines 33-50 and Figure 1);
- b. Circuitry for determining if a specified condition register field is used to store a branch condition of the conditional branch instruction (Henry column 7, lines 36-38 and column 9, lines 31-44); and
- c. Circuitry for providing a software branch prediction of the conditional branch instruction as a function of the determination if the specified condition register field is used to store the branch condition of the conditional branch instruction

(Henry Abstract, lines 13-14; column 4, lines 49-52; column 5, lines 8-12 and 35-38; column 9, lines 31-44; and Figure 2).

13. Referring to claim 39, Henry has taught a data processing system for predicting whether a conditional branch instruction will be taken or not taken, the data processing system comprising the program steps of:

- a. Determining if the conditional branch instruction is positioned at a specified address in a sequence of instructions being executed (Henry column 7, line 5-6); and
- b. Predicting whether the conditional branch instruction will be taken or not taken as a function of the position of the specified address (Henry column 7, lines 5-8).

14. Referring to claim 40, Henry has taught wherein the predicting program step will predict taken if the specified address is a multiple of specified number N (Henry column 8, lines 14-16 and 31-41 and column 7, lines 5-8).

Response to Arguments

15. Applicant's arguments filed 08 January 2004 have been fully considered but they are not persuasive.

16. Examiner notes that Intel's Pentium® Processor Family Developer's Manual Volume 3: Architecture and Programming Manual, ©1995 was incorporated by reference in Henry on column 9, lines 41-45. The principles found in Intel's Pentium® Processor Family Developer's Manual Volume 3: Architecture and Programming Manual, ©1995 were inherent to Henry's preferred embodiment, which used the x86 conditional jump instructions. The examiner had provided pages 3-13 to 3-16 of this reference in a previous action to clarify certain points, and

has provided pages 4-25 to 4-26 and D-1 to D-2 with this response for further clarification and information.

17. Applicants argue in essence:

a. On page 6, paragraph 1

“Applicants respectfully assert that Henry does not disclose ‘providing a software branch prediction of the conditional branch instruction as a function of the determination if the specified condition register field is used to store the branch condition of the conditional branch condition’ ...”;

b. On page 7, paragraph 3

“...Henry does not disclose ‘wherein the software branch prediction predicts that the conditional branch instruction will be taken if the specified condition register field is used to store the branch conditional of the conditional branch instruction’ ...”

c. On page 8, paragraph 2

“Applicants further assert that Henry does not disclose ‘wherein the software branch prediction predicts that the conditional branch instructions will be not taken if the specified condition register field is used to store the branch conditional of the conditional branch instruction’ ...”

18. These have not been found persuasive. Henry has disclosed a branch prediction of taken or not taken based upon what they have called a “conditional branch instruction test type”, and, as taught in Henry in column 9, lines 31-45, the test types includes conditions based upon the carry, overflow, zero, parity, and sign flags of the x86 FLAGS. These individual flags are

represented by individual bit fields within the x86 FLAGS register, as can be seen in Intel's Pentium® Processor Family Developer's Manual Volume 3: Architecture and Programming Manual, ©1995 pages 3-13 to 3-14. The x86 FLAGS register is a condition register, since it stores the condition of each status flag. Each individual flag is stored in a specific area, or field, within the condition register. Therefore, a condition register field presents an individual status flag in the x86 FLAGS register.

19. Applicants argue in essence:

a. On page 6, paragraph 2

"Applicants further assert that Henry does not disclose 'determining if the conditional branch instruction is positioned at a specified address in a sequence of instructions being executed'..."

b. On page 7, paragraph 1

"Applicants further assert that Henry does not disclose 'predicting whether the conditional branch instruction will be taken or not taken as a function of the position of the specified address'..."

20. These have not been found persuasive. Henry has taught in column 7, lines 5-9; column 8, lines 14-16 and 31-41; and shown in Figures 1 and 2 that a branch prediction is based upon the branch instruction address. The branch instruction address identifies the location a branch instruction in a sequence of instructions. As is known in the art, the instruction pointer register (IP register) contains the current position of the instruction being executed in a sequence of instruction. This IP Register sends the position of the instruction via a signal to the branch

predictor so that the branch predictor will make a prediction based upon the branch instruction address.

21. Applicants argue in essence:

- a. On page 8, paragraph 1

“Applicants further assert that Henry does not disclose ‘wherein the software branch prediction predicts that the conditional branch instruction will be not taken if the specified condition register field is not used to store the branch conditional of the conditional branch instruction’...”

- b. On page 9, paragraph 1

“Applicants further assert that Henry does not disclose ‘wherein the software branch prediction predicts that the conditional branch instruction will be taken if the specified condition register field is not used to store the branch conditional of the conditional branch instruction’...”

22. These have not been found persuasive. Please see above with regards to a prediction is based upon a condition register field. In this instance, Henry’s predictor bases a prediction off of the instruction test type, which includes the flag fields found within the x86 FLAGS register. As stated by Henry in column 7, lines 18-20, the static prediction is based upon the test condition test type, which indicates whether a specified condition register field is used or not used by the branch conditional. For example, the x86 conditional jump instructions, which are the same as conditional branch instructions, referred to by Henry in column 9, lines 36-37 include instructions with test types which refer to specific fields within the condition register, such as a jump on carry which refers to the carry field within the condition register. The predictor of

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Henry would determine a branch prediction based upon whether or not the branch test type is a jump on carry or not. Also, the x86 conditional jump instructions include instructions with test types that do not refer to specific fields within the condition register, such as a jump if greater. These type of conditional branch test types do not refer to any of the condition register fields in the x86 FLAGS register, and Henry's predictor will predict them as taken or not taken accordingly. Please see Intel's Pentium® Processor Family Developer's Manual Volume 3: Architecture and Programming Manual, ©1995 pages 4-25 to 4-26 and D-1 to D-2 for more information. Whether Henry predicts a branch test type as taken or not taken in specific instances does not matter, since this does not change the functionality of the device.

23. Applicants argue in essence on page 10, paragraph 1 "Applicants further assert that Henry does not disclose 'wherein the specified condition register field is N, where N is an integer'...". This has not been found persuasive. The condition register fields of Henry are referred to by the names of the flags that they represent to simplify and avoid confusion during explanation. However, the actual reference to these fields by a computer would be to its bit location, which is an integer number. To reference a specific field within the condition register, the computer would reference the field by its bit location, i.e. if the system wanted to reference the carry flag it would look at bit location 0 in the x86 FLAGS register. Please see Intel's Pentium® Processor Family Developer's Manual Volume 3: Architecture and Programming Manual, ©1995 pages 3-13 to 3-14 for more information. Whether Henry refers to the condition register fields by number or by a name does not matter, since the system would function the same whether the field has been given a number or a name in the disclosure.

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24. Applicants argue in essence on page 10, paragraph 2 "Applicants further assert that Henry does not disclose 'wherein the predicting program step will predict taken if the specified address is a multiple of specified number N'...". This has not been found persuasive. As shown above, Henry has taught a prediction is based upon the branch address. The global history table is indexed, which provides a dynamic branch prediction in the system, by hashing the branch address with the global history register to index the actual history tables. Hashing the branch address with the global history register means, in essence, numerically manipulating the address, which includes determining whether the branch address is a multiple of the global history register. Please see the attached definitions of hashing, hash total, etc. from Jerry M. Rosenberg's Dictionary of Computers, Information Processing, & Telecommunications Second Edition ©1987 page 268, Microsoft's Computer Dictionary: The Comprehensive Standard for Business, School, Library, and Home Second Edition ©1994 page 193, and InstantWeb's Online Computing Dictionary ©1997 search terms "hashing" and "hash function" for more information.

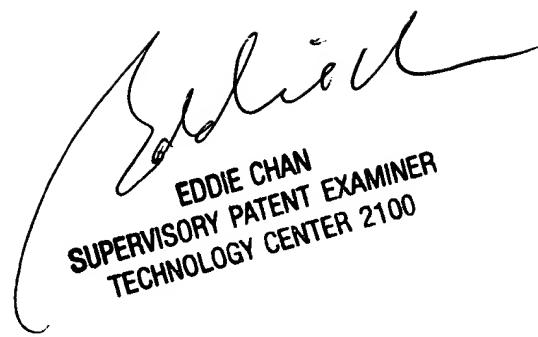
Conclusion

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure as follows. Applicant is reminded that in amending in response to a rejection of claims, the patentable novelty must be clearly shown in view of the state of the art disclosed by the references cited and the objections made. Applicant must also show how the amendments avoid such references and objections. See 37 CFR § 1.111(c).

- a. Prener, U.S. Patent Number 5,125,092, refers to a condition register having multiple fields.

26. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).
27. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.
28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aimee J Li whose telephone number is (703) 305-7596. The examiner can normally be reached on M-T 7:30am-5:00pm.
29. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on (703) 305-9712. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.
30. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AJL
Aimee J. Li
March 18, 2004


EDDIE CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

REVISED AMENDMENT PRACTICE: 37 CFR 1.121 CHANGED COMPLIANCE IS MANDATORY - Effective Date: July 30, 2003

All amendments filed on or after the effective date noted above must comply with revised 37 CFR 1.121. See Final Rule: **Changes To Implement Electronic Maintenance of Official Patent Application Records** (68 Fed. Reg. 38611 (June 30, 2003), posted on the Office's website at: <http://www.uspto.gov/web/patents/ifrw/>) with related information. The amendment practice set forth in revised 37 CFR 1.121, and described below, replaces the voluntary revised amendment format available to applicants since February 2003. **NOTE: STRICT COMPLIANCE WITH THE REVISED 37 CFR 1.121 IS REQUIRED AS OF THE EFFECTIVE DATE (July 30, 2003).** The Office will notify applicants of amendments that are not accepted because they do not comply with revised 37 CFR 1.121 via a Notice of Non-Compliant Amendment. See MPEP 714.03 (Rev. 1, Feb. 2003). The non-compliant section(s) will have to be corrected and the entire corrected section(s) resubmitted within a set period.

Bold underlined italic font has been used below to highlight the major differences between the revised 37 CFR 1.121 and the voluntary revised amendment format that applicants could use since February, 2003.

Note: The amendment practice for reissues and reexamination proceedings, except for drawings, has not changed.

REVISED AMENDMENT PRACTICE

I. Begin each section of an amendment document on a separate sheet:

Each section of an amendment document (e.g., Specification Amendments, Claim Amendments, Drawing Amendments, and Remarks) must begin on a separate sheet. Starting each separate section on a new page will facilitate the process of separately indexing and scanning each section of an amendment document for placement in an image file wrapper.

II. Two versions of amended part(s) no longer required:

37 CFR 1.121 has been revised to **no longer require** two versions (a clean version and a marked up version) of each replacement paragraph or section, or amended claim. Note, however, the requirements for a clean version and a marked up version for **substitute specifications** under 37 CFR 1.125 have been retained.

A) Amendments to the claims:

Each amendment document that includes a change to an existing claim, cancellation of a claim or submission of a new claim, **must include a complete listing** of all claims in the application. After each claim number in the listing, the status must be indicated in a parenthetical expression, and the **text of each pending claim** (with markings to show **current changes**) must be presented. The claims in the listing will replace all prior claims in the application.

- (1) The current status of all of the claims in the application, including any previously canceled, not entered or withdrawn claims, must be given in a parenthetical expression following the claim number using only one of the following seven status identifiers: (original), (currently amended), (canceled), (withdrawn), (new), (**previously presented**) and (**not entered**). The text of all pending claims, **including withdrawn claims**, must be submitted each time any claim is amended. Canceled **and not entered** claims must be indicated by only the claim number and status, without presenting the text of the claims.
- (2) The text of all claims **being currently amended** must be presented in the claim listing with markings to indicate the changes that have been made relative to the immediate prior version. The changes in any amended claim must be shown by underlining (for added matter) or strikethrough (for deleted matter) with 2 exceptions: (1) for **deletion of five characters or fewer, double brackets may be used** (e.g., **[[eroor]]**); and (2) if **strikethrough cannot be easily perceived** (e.g., **deletion of the number "4" or certain punctuation marks**), **double brackets must be used** (e.g., **[[4]]**). As an alternative to using double brackets, however, extra portions of text may be included before and after text being deleted, all in strikethrough, followed by including and underlining the extra text with the desired change (e.g., **number 4 as number 14 as**). An accompanying clean version is not required and should not be presented. Only claims of the status "currently amended," and "withdrawn" that are being amended, may include markings.
- (3) The text of pending claims **not being currently amended**, **including withdrawn claims**, must be presented in the claim listing in clean version, i.e., without any markings. Any claim text presented in clean version will constitute an assertion that it has not been changed relative to the immediate prior version except to omit markings that may have been present in the immediate prior version of the claims.

- (4) A claim being canceled must be listed in the claim listing with the status identifier “canceled”; the text of the claim must not be presented. Providing an instruction to cancel is optional.
- (5) Any claims added by amendment must be presented in the claim listing with the status identifier “(new)”; the text of the claim must not be underlined.
- (6) All of the claims in the claim listing must be presented in ascending numerical order. Consecutive canceled, or not entered, claims may be aggregated into one statement (e.g., Claims 1 – 5 (canceled)).

Example of listing of claims (use of the word “claim” before the claim number is optional):

Claims 1-5 (canceled)
Claim 6 (previously presented): A bucket with a handle.
Claim 7 (withdrawn): A handle comprising an elongated wire.
Claim 8 (withdrawn): The handle of claim 7 further comprising a plastic grip.
Claim 9 (currently amended): A bucket with a ~~green~~ blue handle.
Claim 10 (original): The bucket of claim 9 wherein the handle is made of wood.
Claim 11 (canceled)
Claim 12 (not entered)
Claim 13 (new): A bucket with plastic sides and bottom.

B) Amendments to the specification:

Amendments to the specification, including the abstract, must be made by presenting a replacement paragraph or section or abstract marked up to show changes made relative to the immediate prior version. An accompanying clean version is not required and should not be presented. Newly added paragraphs or sections, including a new abstract (instead of a replacement abstract), must not be underlined. A replacement or new abstract must be submitted on a separate sheet, 37 CFR 1.72. If a substitute specification is being submitted to incorporate extensive amendments, both a clean version (which will be entered) and a marked up version must be submitted as per 37 CFR 1.125.

The changes in any replacement paragraph or section, or substitute specification must be shown by underlining (for added matter) or strikethrough (for deleted matter) with 2 exceptions: (1) for deletion of five characters or fewer, double brackets may be used (e.g., [[eroor]]); and (2) if strikethrough cannot be easily perceived (e.g., deletion of the number “4” or certain punctuation marks), double brackets must be used (e.g., [[4]]). As an alternative to using double brackets, however, extra portions of text may be included before and after text being deleted, all in strikethrough, followed by including and underlining the extra text with the desired change (e.g., number 4 as number 14 as)

C) Amendments to drawing figures:

Drawing changes must be made by presenting replacement figures which incorporate the desired changes and which comply with 37 CFR 1.84. An explanation of the changes made must be presented either in the drawing amendments, or remarks, section of the amendment, and may be accompanied by a marked-up copy of one or more of the figures being amended, with annotations. Any replacement drawing sheet must be identified in the top margin as “Replacement Sheet” and include all of the figures appearing on the immediate prior version of the sheet, even though only one figure may be amended. Any marked-up (annotated) copy showing changes must be labeled “Annotated Marked-up Drawings” and accompany the replacement sheet in the amendment (e.g., as an appendix). The figure or figure number of the amended drawing(s) must not be labeled as “amended.” If the changes to the drawing figure(s) are not accepted by the examiner, applicant will be notified of any required corrective action in the next Office action. No further drawing submission will be required, unless applicant is notified.

Questions regarding the submission of amendments pursuant to the revised practice set forth in this flyer should be directed to: Elizabeth Dougherty or Gena Jones, Legal Advisors, or Joe Narcavage, Senior Special Projects Examiner, Office of Patent Legal Administration, by e-mail to patentpractice@uspto.gov or by phone at (703) 305-1616.